

CLAIMS

We claim:

1. A method of routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the method comprising:
 - a) producing at least one potential route segment;
 - b) testing the at least one potential route segment to determine whether it creates an acute angle in the route; and
 - c) preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route.
2. The method of claim 1 wherein an acute angle is created in the route when a route segment in the route connects with a start or target geometry at an angle of less than 90°.
3. The method of claim 2 further comprising, before step a),
 - defining at least one border region about the start or target geometry; and
 - defining at least one routing rule associated with the border region,wherein step b) comprises:
 - determining whether the potential route segment is within the border region; and
 - upon determining that the potential route segment is within the border region, testing the potential route segment to determine if the potential route segment meets the associated routing rule.

4. The method of claim 3 wherein the routing rule prohibits particular routing directions within the border region that would result in an acute angle being formed at a connection point between a route segment in the route and a start or target geometry.
5. The method of claim 3 wherein:
 - the border region neighbors a side of the start or target geometry having a vertical or horizontal orientation; and
 - the routing rule prohibits diagonal routing directions within the border region.
6. The method of claim 3 wherein:
 - the border region neighbors a side of the start or target geometry having a diagonal orientation; and
 - the routing rule prohibits vertical or horizontal routing directions within the border region.
7. The method of claim 3 wherein the border region is defined to have a thickness that is equal to a minimum length of a route segment specified by a predetermined design rule.
8. The method of claim 7 wherein the routing rule associated with the border region specifies that all route segments in the border region have the same routing direction.
9. A method of routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the method comprising:
 - a) producing a potential route segment;

b) testing the potential route segment to determine whether it creates an acute angle in the route;

c) preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route;

d) including the potential route segment in the route between the start and target geometries upon determining that the potential route segment does not produce an acute angle in the route; and

e) iteratively repeating steps a), b), c), and d).

10. The method of claim 9 wherein:

a route segment comprises an interconnect line or a via; and

an acute angle is created in the route when a route segment in the route connects with another route segment in the route at an angle of less than 90°.

11. The method of claim 10 wherein step b) comprises:

referring to a pretabulated configuration table to determine whether the potential route segment creates an acute angle in the route.

12. The method of claim 11 wherein the configuration table is a line-to-line configuration table that contains various connection configurations between two interconnect lines and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.

13. The method of claim 12 wherein the line-to-line configuration table contains connection configurations where at least one of the two interconnect lines has directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°.

14. The method of claim 11 wherein the configuration table is a line-to-via configuration table that contains various connection configurations between an interconnect line and a via pad of a via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.
15. The method of claim 14 wherein the line-to-via configuration table contains connection configurations where the interconnect line has directions of 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°.
16. The method of claim 14 wherein the line-to-via configuration table contains connection configurations of via pads having different shapes.
17. The method of claim 11 wherein the configuration table is a via-to-via configuration table that contains various connection configurations between a first via pad of a first via and a second via pad of a second via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.
18. The method of claim 17 wherein the via-to-via configuration table contains connection configurations of via pads having different shapes.
19. A computer readable medium that stores a computer program for routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the computer program comprising sets of instructions for:
 - a) producing at least one potential route segment;
 - b) testing the at least one potential route segment to determine whether it creates an acute angle in the route; and

- c) preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route.
- 20. The computer readable medium of claim 19 wherein an acute angle is created in the route when a route segment in the route connects with a start or target geometry at an angle of less than 90°.
- 21. The computer readable medium of claim 20 wherein:
 - the computer program further comprises sets of instructions for:
 - defining at least one border region about the start or target geometry; and
 - defining at least one routing rule associated with the border region;
 - and
 - the set of instructions for b) testing the at least one potential route segment comprises a set of instructions for
 - determining whether the potential route segment is within the border region; and
 - upon determining that the potential route segment is within the border region, testing the potential route segment to determine if the potential route segment meets the associated routing rule.
- 22. The computer readable medium of claim 21 wherein the routing rule prohibits particular routing directions within the border region that would result in an acute angle being formed at a connection point between a route segment in the route and a start or target geometry.

23. The computer readable medium of claim 21 wherein:
- the border region neighbors a side of the start or target geometry having a vertical or horizontal orientation; and
 - the routing rule prohibits diagonal routing directions within the border region.
24. The computer readable medium of claim 21 wherein:
- the border region neighbors a side of the start or target geometry having a diagonal orientation; and
 - the routing rule prohibits vertical or horizontal routing directions within the border region.
25. A computer readable medium that stores a computer program for routing a route that connects a start geometry and a target geometry, the route being comprised of one or more connected route segments, the computer program comprising sets of instructions for:
- a) producing a potential route segment;
 - b) testing the potential route segment to determine whether it creates an acute angle in the route;
 - c) preventing the at least one potential route segment from being included in the route between the start and target geometries upon determining that the potential route segment produces an acute angle in the route;
 - d) including the potential route segment in the route between the start and target geometries upon determining that the potential route segment does not produce an acute angle in the route; and

- f) iteratively repeating the sets of instructions for a), b), c), and d).
26. The computer readable medium of claim 25 wherein:
- a route segment comprises an interconnect line or a via; and
 - an acute angle is created in the route when a route segment in the route connects with another route segment in the route at an angle of less than 90°.
27. The computer readable medium of claim 26 wherein the set of instructions for b) testing the potential route segment comprises a set of instructions for referring to a pretabulated configuration table to determine whether the potential route segment creates an acute angle in the route.
28. The computer readable medium of claim 27 wherein the configuration table is a line-to-line configuration table that contains various connection configurations between two interconnect lines and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.
29. The computer readable medium of claim 27 wherein the configuration table is a line-to-via configuration table that contains various connection configurations between an interconnect line and a via pad of a via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.
30. The computer readable medium of claim 27 wherein the configuration table is a via-to-via configuration table that contains various connection configurations between a first via pad of a first via and a second via pad of a second via and an entry for each connection configuration indicating whether the connection configuration contains an acute angle.